III

REMARKS ON THE TREATMENT OF ACUTE GONORRHŒAL URETHRITIS IN THE MALE*

WITH SPECIAL REFERENCE TO A SERIES OF CASES TREATED AT THE SALFORD MUNICIPAL CLINIC ON A METHOD DESCRIBED BY PELOUZE

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PRELIMINARY CONSIDERATIONS

PELOUZE does not believe that gonococci are destroyed in the body by the bactericidal properties of the substances employed against them. He aims rather at hastening the natural processes of dealing with the disease. This he achieves by gently stimulating the tissues, at the same time refraining from any treatment which devitalises the urethral mucosæ, or which hinders free drainage.

This principle of stimulating and increasing the natural reaction of the tissues is, to my mind, one of the most important factors in the treatment of gonorrhœa. It is by no means new. Many authors have previously drawn attention to it.

Lord Moynihan, in 1920, writes: " It is very doubtful whether the antiseptic action produced by the addition of a particular chemical substance to a wound is due to the properties which it possesses as a bactericide. It probably possesses other properties also, which are not strictly related to its germicidal power."

Frazer, who quotes the above passage, observing the excellent results of the Carrel-Dakin treatment of wounds during the war, has tried to obtain this combination of tissue stimulation and free drainage by giving urethral irrigations of Milton—a preparation of sodium hypochlorite—together with daily doses of mixed gonococcal vaccine.

* Based on an address delivered before the Medical Society for the Study of Venereal Diseases, May 29th, 1931.

It seems probable that the good results obtained by such diverse methods as diathermy, vaccines, protein and malaria therapy, hæmotherapy and intravenous dye injections, are due to their stimulating effect on the natural body power of dealing with the disease.

Pelouze believes that of these body processes, that of antibody formation is the most important. This is a very delicate and capricious process, and is easily upset by any change in the stimulus which encourages its formation. A glass of beer or mild sexual excitement at a week-end will undo the good results of a week's treatment. The rhythm with which the stimulus is given is important. If the latter is obtained through local treatment, an interruption of this treatment will often completely upset the antibody formation process.

When the conditions for antibody formation are perfect and the process well established, it is sometimes astonishing how quickly cure is brought about. I have one most interesting case of antero-posterior urethris in which for some reason no posterior treatment was given. With anterior treatment only, both glasses remained cloudy during a period of five days. In the succeeding twenty-four hours all discharge ceased, both glasses cleared, and the case passed through tests of cure without any mishap.

Pelouze's Method of Treatment for Anterior Urethritis

Briefly, Pelouze's treatment of anterior urethritis consists of :—

Daily irrigation of the anterior urethra only with 1/5000 potassium permanganate solution, followed immediately by an instillation of 5 per cent. commercial silver nucleinate.

This treatment is given once daily for several weeks. It is controlled by daily graphic charting of the two-glass test. When there has been a period free from discharge and with clear urines a forty-eight-hour interval is given. Should the discharge recur, treatment is given daily, or on alternate days for a further week, after which the intervals between treatments are lengthened, and the patient put on to tests of cure.

These tests include the passage of bougies, provocative

vaccines, massage of the anterior urethra over metal sounds, and examination after the taking of alcohol.

Pelouze states that of the patients who present themselves for this treatment during the first four days of the discharge, only 15 per cent. develop posterior urethritis.

To refractory cases, especially blondes, he recommends giving small doses of gonococcal vaccines (150 to 300 million gonococci), at intervals of two, three and four days. This, he says, will bring 75 per cent. of the refractory cases into line.

Other procedures he advocates are :—

Weakening the preparations.

Using the permanganate alone.

Substituting 5 per cent. neosilvol, or $\frac{1}{4}$ per cent. to $\frac{1}{2}$ per cent. protargol, for the silver nucleinate for three to four days.

The irrigating reservoir should not be higher than $2\frac{1}{2}$ feet above the pelvis. The urethra must only be gently dilated. None of the permanganate must remain in the urethra. The length of time during which the nucleinate is instilled is that which will provoke slight irritation but not cause pain. No oral treatment is given. The patient is warned of the dangers of alcohol, sexual excitement, and of performing violent exercise with a full bladder.

These are only the main features of Pelouze's treatment as set out in his book " Gonococcal Urethritis in the Male." For further details the book itself must be consulted.

I should like to make a few remarks on the essential features of the method. These are :—

(1) The use of the two-glass test as a control.
(2) The preference for hydrostatic irrigation as opposed to hand syringing.
(3) The irrigation of the anterior urethra only in anterior urethritis.
(4) Refraining from oral medication.
(5) The substances employed.

The Two-glass Test

Pelouze regulates his treatment by charting the condition of the urine graphically. The days of treatment are laid off as abscissæ, the varying states of the two-glass test as ordinates. The most favourable condition—clear

in both glasses—is the base line ; the least favourable—cloudy urine in the first glass and blood in the second glass—is furthest removed from the base line.

The value of such charting is obvious. The case becomes, as it were, an open book. Indiscretions of behaviour are at once revealed by a jump upwards in the chart. It is besides a valuable help in prognosis.

This graphic method of daily charting much enhances the value of the two-glass test. When the latter is done only occasionally or at weekly intervals, I admit it is most unreliable ; but when taken daily and charted in this manner, it is of immense assistance in the management of early gonorrhœa.

The criticism levelled against the two-glass test is that it does not reveal the presence of posterior urethritis, unless the latter is severe enough to render the contents of the bladder turbid. In daily charting I have noticed that the two-glass test agrees remarkably well with the clinical symptoms.

In new cases, however, when it is important to know the earliest time of posterior involvement, the anterior urethra should be first washed out and the urine then passed and examined. From cases I have observed it is clear that this method will reveal the presence of posterior urethritis two, three, or even four, days before the latter is shown by the two-glass test, and for this reason it should be performed on every new case that does not present definite symptoms of posterior urethritis. It is useful also during treatment after indiscretions or periods of absence when the possibility of posterior involvement is suspected.

The Preference for Hydrostatic Irrigations as Opposed to Hand Syringing

Although a hand-syringe is illustrated by Pelouze in his book for use when hydrostatic irrigations are impracticable, he has no hesitation in showing his preference for the latter.

I think the majority of us to-day are convinced that for safety, asepsis, and for the employment of a sufficient quantity of irrigating fluid, the hydrostatic method is the better.

Yet books on gonorrhœa are still being brought out

advising hand syringing. In *The Lancet* last year, Livingstone Spence writes: "The worst thing one can do is to attempt to irrigate the bladder from the meatus, infections of the seminal vesicles and prostate being in such cases almost inevitable, and extension to the epididymes likely. With the Janet method of irrigation from the meatus, there is the danger of injuring the inflamed mucous membrane through over-distention, and Kohnstam and Cave have shown how easily fluid is driven into the seminal vesicles during forced irrigation of the bladder."

What Kohnstam and Cave did observe in their radiograms of the bladder and urethra, for which the opaque medium was forced into the urethra by a hand-bellows through a Kimpton tube, was that the ejaculatory ducts and seminal vesicles were occasionally filled. They found that this was so more often in some pathological conditions, such as simple enlargement of the prostate, or in general dilatation behind a stricture. They do not suggest that in the normal individual filling of the ducts or vesicles is common. They do not state the pressure used; but their illustrations show the bladder well distended with the opaque medium.

Complete filling of the bladder is not recommended by the advocates of total irrigation by the hydrostatic method. It seems illogical to cast aside so well-tried a method, when all that is necessary for safety is the avoidance of grossly excessive pressure.

Anterior *v.* Total Irrigation for Anterior Urethritis

Pelouze confines his treatment to the anterior urethra when that part only is infected. Many hold the view that complete lavages should be given from the onset, or within a few days of the onset of the disease. There is no doubt whatever that excellent results are obtained by both methods. If, however, a short cure is looked for, I think the anterior method must be adopted.

Pelouze believes that it is not only the action of the compressor urethræ that prevents the posterior urethra from becoming involved, but that the latter is also protected by the nature of its epithelium. Jadassohn and Finger have shown that penetration of gonococci through pavement epithelium is rare, and that the transitional

epithelium of the posterior urethra has some protective powers.

Deschamps in Europe in 1907, and Hühner in America in 1909, were among the early advocates of total irrigation. Deschamps holds this view on the grounds that three-fifths of his cases with discharge of three days' duration, and all his cases of eight days' duration, had posterior involvement.

Hühner recommends total irrigation as giving rise to less posterior infections and complications, and causing more complete opening of the urethral mucosæ.

Colonel Harrison advises total irrigation. He gives as his reasons the fact that " posterior infection is not unknown under purely anterior treatment," and that " it is impossible to detect the moment when the infection is implanted in the posterior urethra." He affirms that the effect of anterior irrigation in removing plugs from crypts is very slight—the fluid slops out—and that the " lavage which is obtained by rebound from the face of the sphincter cannot be nearly so effective as that which results from the expulsion of the fluid by a strongly acting bladder." Further, Colonel Harrison censures those who rely on the two-glass test for the diagnosis of posterior urethritis.

Several English text-books quote Janet as being the leader of the total lavage school. But no one is more insistent than he that treatment should be confined to the part affected. That is, if the anterior urethra only is involved, treat the anterior urethra. His reasons are :—

First, that he has seen cases, manifestly anterior, in which he has washed out both urethræ, and in which posterior urethritis has nevertheless ensued.

Secondly, that there is nothing to prove that posterior lavage does not push up the organisms from the anterior to the posterior urethra, and allow them to remain there.

Thirdly, that there is plently of time at the first sign of posterior infection, to carry out total irrigation, and that this will be much easier if the congestion of the anterior urethra has subsided as a result of the treatment already given.

He states that not more than three out of ten of his cases of anterior urethritis become posterior during treatment.

Watson relies on the fact that any organisms finding

their way into the bladder or the recesses of the posterior urethra, are expelled on the completion of the irrigation, by the patient's clearing his bladder contents. He, however, states that antiseptics suitable for urethral use require in most cases a minimum of ten minutes to kill the gonococcus.

Pelouze has observed healthy gonococci in urethræ which have been accidentally injected with such strong solutions as tincture of iodine, 1/200 perchloride of mercury, saturated permanganate of potash, and 10 per cent. zinc chloride.

Advocates of total lavage treatment are thus relying:

(1) On the antiseptic solutions killing the gonococci which enter the bladder.

(2) On the gonococci all being washed out after the irrigation.

(3) On the relatively high protective powers of the mucous membrane of the posterior urethra and bladder, in comparison with that of the anterior urethra.

It does not seem to me that these three factors are altogether worthy of the trust that is placed in them. I cannot imagine a wave of gonococci-laden antiseptic solution entering the bladder and failing to leave some of the organisms behind. Admittedly they may in most cases be washed away by the urine, or by subsequent irrigations, before they have established themselves in the submucosæ; but it seems wrong in principle and practice to introduce gonococci to a part of the urethra hitherto free from them, and to treat that part before it becomes infected.

I have had several cases on anterior treatment who had received a posterior irrigation in error, and who had no further posterior irrigation. Each developed a posterior urethritis.

Oral Medication

Pelouze favours no other medication than water or barley water.

We have learnt not to pin our faith on the balsamics, urinary antiseptics, or on the oral use of dyes. The majority of us confine our oral treatment to the use of alkaline diuretics.

This fact possibly has its origin in Thompson's discovery that gonococci are very soluble in alkaline media.

Pelouze, working with S. Gonzales, has shown that the passage of either an acid or an alkaline urine through the urethra causes an almost immediate increase of urethral alkalinity. This increased alkalinity is so independent of the degree of acidity or alkalinity of the urine that they do not think that medication is of value in gonorrhœa through any change it may cause in the character of the urine.

Janet asserts that bicarbonate of soda is favourable to the culture of the gonococcus, and that beer can be replaced by a glass of Vichy water as a test of cure in gonorrhœa. He remarks that gonorrhœa patients who go to Vichy are notorious for their relapses. The urethra, he says, is adapted for passing a slightly acid urine, and he does not see why an affected urethra should not be allowed the same. He forbids alkaline and gaseous drinks in gonorrhœa.

Hoffmann, in Bonn, also notes that highly gaseous waters are bad in cases of gonorrhœa. I suggest that it is the alkalinity and not the carbonic acid gas that does the harm.

I can recall one case who speedily developed posterior urethritis after drinking large quantities of Vichy water, and another very resistant case who was taking sodium bicarbonate by mouth for gastric ulcer.

I have not found that cases do better on alkaline diuretics during early gonorrhœa, than those who have had no medication whatever.

I might mention that I have found ginger-beer to have as bad an effect as ordinary beer.

Discussion of the Substances Used

I should like to say a few words about the substances used, and the opinions of various authors as to their action.

(A) *Potassium Permanganate*

First, potassium permanganate. This, Pelouze recommends in a strength of 1/5000 for urethral irrigation. Its bactericidal value and its so-called astringent action are, he asserts, insignificant in this strength. It is in its *rôle* of tissue stimulant that it is here used.

Luys thinks that permanganate of potash has a selective

action on the gonococcus, and, in addition, a constricting effect on the urethral mucosæ, shrivelling it up, and, as it were, massaging the glands of Littre and the lacunæ of Morgagni.

Janet attributes three actions to permanganate of potash :—

(1) That it has a bactericidal effect.

(2) That it stimulates the natural means of body defence.

(3) That it produces hyperæmia and exudation of serum.

Although he finds that his quickest cures were obtained with this last action of permanganate, strong solutions, 1/500 to 1/100, were necessary for its production. Owing to the resulting thickening of the mucous membrane, and persistent secondary urethritis, Janet has now discontinued the use of permanganate of this strength. The strength he uses to-day varies from 1/20,000 to 1/1,000.

Too weak a solution, he states, has no effect. Too strong a solution stimulates the gonococci to further activity. He believes that for every stage of the disease there is an optimum strength of permanganate. Too long use of one strength allows the organisms to regain their vigour.

Potassium permanganate exerts its effect during and immediately after an irrigation only. It decomposes very quickly in contact with the urine and the tissues into the dioxide of manganese. Hence the uselessness of leaving the solution in the bladder.

(B) *Silver Compounds*

(*a*) *Silver Nucleinate.*—Commercial silver nucleinate is chosen by Pelouze as the instillation of choice. He does not state the silver content of the preparation, but says that in solution it closely resembles argyrol in appearance and in action.

The commercial silver nucleinate which I have been using contains about 18 to 20 per cent. of silver. The original argyrol made by Barnes and Hille, of Philadelphia, is said to be a compound of silver and vitellin, and to contain 30 per cent. of silver.

There are two similar French preparations, phytol and vitargyl, containing about 20 per cent. of silver, and one marketed by Allen and Hanbury, nargol, a compound of

silver and yeast nucleinic acid, containing 10 per cent. of silver. I have had no experience with these last three substances.

The chief disadvantage of these preparations is that they stain badly. The stain may be removed from clothing by treating with a 1/500 solution of corrosive sublimate solution.

The only advantage that commercial silver nucleinate has over argyrol is that its cost is less than one-third.

It is essential that the silver nucleinate solution be prepared freshly every week. Pelouze finds that the most suitable strength is 5 per cent. This does no damage to the urethral mucosæ if it is used once a day only. He finds the most suitable length of time of instillation to be five minutes. Naturally the time of instillation and the strength of the compound have to be varied to suit the needs of different individuals.

The strength may be judged correct if the patient feels slight irritation during the instillation, and if there is a small transient urethral discharge shortly after treatment. If the solution is retained too long, or if the strength is excessive, pain will be experienced, and the discharge after treatment will be profuse.

The nucleinate is more efficacious after the surface mucus has been washed away by the permanganate irrigation.

(*b*) *Silver Compounds.*—The silver compounds are widely used throughout Central Europe in the treatment of gonorrhœa. Indeed marked preference is given to them over all other remedies.

Haxthausen has conveniently divided them into three main classes, according to the facility with which they are broken down by the tissue fluids.

The first group, of which silver nitrate is an example, is almost immediately rendered inactive by being broken down into silver chloride and albuminates as a result of coming into contact with the sodium chloride and albumin of the tissue fluids. Haxthausen believes that it is by the formation of this silver chloride that silver nitrate exerts its bactericidal effect. He finds, however, that only relatively strong solutions of silver nitrate (1 per cent. and above), will be capable of producing deposition of silver chloride in the tissues, and of thus ensuring a continued effect.

A second group of silver compounds forms precipitates of silver chloride and albuminates only slowly; a third group does not form precipitates at all.

Protargol is an example of the second group, while argyrol and argentamin fall into the third group.

Haxthausen has carried out a series of experiments with a view to determining the penetration powers of the different silver salts. He finds that silver nitrate has a maximum penetrating power in strengths of $\frac{1}{4}$ and $\frac{1}{3}$ per cent., and that its penetrating power is greater than that of all other silver compounds save only argyrol and argentamin. This fact has previously been shown by Schaefer and Pezzoli. Schaefer found that argentamin penetrated three times as deeply as silver nitrate.

In his summary Haxthausen states that there is no reliable evidence to prove that organic silver preparations are better than silver nitrate. He affirms that argyrol has a minimum bactericidal effect, as the dissociation is so slight and the precipitation *nil*.

Opinions on argyrol are varied.

Lees states that it gives rise to pain and coagulates albumin.

Foerster says that argyrol has always appeared to him to be an exceptionally weak and inefficient silver preparation.

Asch of Strassbourg, on the other hand, states that a 20 per cent. solution does not cause pain when instilled into the anterior urethra. He does not believe in allowing the instillation to remain for longer than five minutes. He also says that argyrol is the only substance that has never, in his hands, caused tenesmus when used in the posterior urethra.

Watson finds argyrol the least irritating of all silver compounds. He recommends 5 per cent. to 20 per cent. solutions. He considers it less efficient as a laboratory antiseptic than other silver compounds, but, on account of its cleansing action, useful in removing purulent secretions.

Luys says that argyrol is non-caustic, produces no inflammatory reaction, does not coagulate albumen, and has a soothing effect during the acute stage.

Janet has adopted argyrol as the best abortive agent, and uses it in his cases of gonorrhœa as a successor to potassium permanganate where the latter fails.

The Combination of Potassium Permanganate with Silver Salts. (Abortive Treatment)

So far as I can discover, the combination of permanganate irrigations and the instillation of a silver salt has only been tried in the so-called abortive treatments. By such I mean the treatment devised when the discharge is slight and not more than twenty-four hours old, when the gonococci are supposed to be still accessible to the remedial agent.

Janet describes such a combination. He gives an anterior irrigation of potassium permanganate, 1/6,600, which is rendered isotonic by the addition of sodium chloride. This is followed by an irrigation of physiological saline, to prevent the permanganate from coming into contact with the argyrol, which, he says, it decomposes.

Five cubic-centimetres of argyrol is then instilled for five minutes. He finds that this treatment, while being probably the ideal abortive treatment, produces a hæmaturia in some cases, which lasts several days, followed by a simple urethritis of some weeks' duration.

Janet therefore abandoned this method in favour of a pure argyrol abortive treatment.

Lees describes an abortive treatment of alkaline potassium permanganate 1/4,000 followed by colloidal silver instillation.

Harrison describes one in which an instillation of 10 per cent. argyrol is given for fifteen minutes twice daily, preceded by an antero-posterior irrigation of potassium permanganate in the strength of 1/3,000.

We observe that there is very little really new about Pelouze's method, and that the methods most closely resembling it are those used in abortive treatment. To my mind the drawback of many, if not all, abortive measures is that when they fail, the urethral mucous membrane has suffered to such an extent that a treatment which would have been possible had no abortive measures been employed, can no longer be tolerated by the patient.

Pelouze's treatment does not set out to be an abortive treatment. It can be applied to any case of anterior urethritis, and is extremely well tolerated.

In the Salford clinic during the last six months of 1930

only ten cases came for treatment within the first twenty-four hours of their discharge. This was out of 384 new cases of male gonorrhœa.

Our Experience with Pelouze's Method

Our experience with Pelouze's method began in July, 1930. The object was to discover whether the method, which is obviously intended for private practice, could be applied to clinic use, and thereby to offer cases with anterior urethritis a considerably shorter treatment than that found necessary when total irrigations were employed.

The treatment was carried out by orderlies who have had considerable experience in venereal disease. Medical supervision consisted in seeing each patient at least once weekly, and examining the urine charts daily. By means of these charts the patient's progress could be seen instantly, and any alteration in treatment could be ordered without the necessity of seeing the patient personally, which would not be possible in clinic practice.

Only cases who showed a clear urine in the second glass in the two-glass test, and who had no symptoms of posterior urethritis, were chosen for this treatment. I regret that all the cases did not have the anterior urethra washed out before the urines were examined. Only the most recent cases have had this done. I am thus unable to state how many cases who showed themselves to be posterior on the second, third or fourth day were not in reality posteriorly affected from the start.

The patient passes his urine before treatment. This then is the most convenient opportunity to chart the state of the two-glass test. The anterior irrigations of potassium permanganate are given to the patient standing. I do not insist on more than slight ballooning of the anterior urethra. The height of the reservoir is not more than 2 feet above the urethra. The temperature of the solution is not above 100° F. About one pint of fluid is used.

If irrigations are given in the prone position, there may be a tendency for the fluid to remain in the bulb. This should be emptied by gently stroking the under surface of the penis from the bulb to the meatus with the fingers —thus massaging the fluid out of the urethra—on several

occasions during the irrigation. I do not find that the fluid stagnates in the bulb when the patient is in the standing position.

The instillation of silver nucleinate is given with a small glass syringe of 2 c.c. capacity. The meatus is held closed by a penile clamp, or between the patient's fingers. The duration of instillation is that time which causes slight irritation, but does not cause pain. This optimum time is marked on the patient's treatment card. It is generally found to be seven minutes. Treatment is given once a day only.

The patient has careful instructions as to his diet and behaviour. He is particularly requested not to miss treatment for a single day, and to attend as nearly as possible at the same time each day.

Should posterior urethritis develop, posterior irrigations of 1/20,000 permanganate are given, while the silver nucleinate instillations are not discontinued. It has been found that this procedure, combined with an oral sedative such as chloral hydrate and potassium bromide, is of more effect in the prevention of complications, of posterior urethritis, than that of withholding the local treatment and relying on alkaline sedatives and atropine.

Modifications

In cases where the urethritis is very severe, with pain and blood-stained discharge, but still confined to the anterior urethra, I use very weak permanganate irrigations 1/20,000 and 2 per cent. silver nucleinate instillations. I have not found that these strengths cause discomfort.

In most cases I commence with 1/10,000 permanganate and 2 per cent. nucleinate for the first three or four days, instead of the 1/5,000 and 5 per cent. as advised by Pelouze.

I have not found that vaccines, given as Pelouze describes, bring the refractory cases into line. I have tried both ordinary and detoxicated vaccines. I am now trying a series of cases on weekly injections of vaccines made from local strains by Dr. Jenkins at the Salford Royal Hospital. So far the results have been very encouraging (see Group III., Table I.).

I have not found neoprotosil to succeed where silver

nucleinate fails. On the other hand, protargol in strengths of $\frac{1}{4}$ to $\frac{1}{2}$ per cent., when substituted for nucleinate for five to seven days, often clears up the urines.

I have tried some cases without instillations, and some with instillations of other substances. The results have been inferior.

Some cases are able to indulge in a considerable amount of indiscretion, while others have only to drink a glass of beer or absent themselves for a single day to cause the posterior urethra to become involved.

Treatment of Posterior Urethritis

So far I have been regarding posterior urethritis as a complication of gonorrhœa. Its occurrence is so common that it ought to be regarded rather as part of the make-up of the disease. When properly treated I do not think it is nearly as formidable as it is made out to be. I have had several cases where the posterior urethritis has undergone a seemingly spontaneous cure, so that the case has taken no longer to clear up than has an uncomplicated case of anterior urethritis. I do not believe that prostatic infection is necessarily an accompaniment of posterior urethritis.

My experience is that cases of acute posterior urethritis will not stand irrigations of a stronger concentration of potassium permanganate than 1/20,000, and total lavage with this solution has in some cases been all that is necessary to clear up the condition completely.

I have found that of oral preparations a mixture of chloral hydrate and potassium bromide is more successful in preventing complications than alkaline belladonna mixtures. This fact may be explained by the provocative effects of alkalies which have been noticed by Janet and Lambkin.*

* The most favourable reaction of the tissues from the point of view of resulting gonococcal invasion is that when the pH value of the urine is within the limits of 7·2 and 7·4. When the urine is on the acid side of this figure the many gonococci in the secretion are in tetrad formation protected by great amounts of sclero-protein, and, as such, in resistance formation; on the other hand, when it is on the alkaline side, there is considerable autolysis with liberation of irritative endotoxin. Lambkin. *B.J.V.D.* Vol. III., p. 35.

If a man were kept consistently with an alkaline urine, this alkaline urine passing over his tissues actually dissolved the gonococci present in the tissues. The whole organism was lysed, and the product was a toxic substance. In a case of gonorrhœa in a man with a persistently alkaline urine all this dissolving

Where there is difficulty in clearing up the posterior urethritis, I have tried Pelouze's method of injecting silver nucleinate into the posterior urethra by means of a small syringe. I have met with success in all the thirty cases to whom I have given this treatment. There was one casualty, where undue pressure caused epididymitis.

If a syringe of 10 c.c. capacity is used, and the resistance of the cut-off muscle is overcome by persuasion rather than force, and if not more than 2 to 3 c.c. of the solution are injected into the posterior urethra, I do not consider this procedure a dangerous one. The instillation does not cause pain.

It is amazing to note the different capacities assigned to the anterior urethra by various authors. Asch gives a more moderate estimate than many others. He states that the capacity of the anterior urethra is occasionally 4 drams, but recommends instillation of 1 to 1½ drams during acute inflammation, and 1½ to 2 drams when inflammation has subsided.

I have found that 2 c.c. (½ dram) is sufficient in cases of anterior urethritis, and have not yet found it necessary to use a syringe of more than 10 c.c. (3 drams) capacity, to fill both anterior and posterior urethræ.

Tests of Cure

The tests of cure which I employ are vigorous. They include :—

Massage of the urethra over sounds ;

Examination of the urine, and urethral and prostatic smears after provocative vaccines ;

The passage of full-size sounds into the bladder ;

Urethroscopy ; and

Examination after intra-cutaneous injections of aolan.

All the cases in the first group of Table I. have been observed for four to six months.

The urethroscopic appearance of cases treated by Pelouze's method is usually normal, though in some the mucous membrane is somewhat redder than normal.

went on in his urethra or in his tissues, and the ultimate effect was provocation and an exacerbation of all his symptoms. If this was bad enough and persistent enough he would show signs of irritation in his posterior urethra, and might go on to a frank posterior urethritis. Lambkin. *B.J.V.D.* Vol. III., p. 58.

Complications

Among 180 cases I have observed these complications :

Complications during anterior urethritis :

Urethral discomfort : 4 cases (none severe).

Œdema of prepuce and inflammation of meatus : 2 cases.

Periurethral abscesses : 1 case.

Paraphimosis : 1 case (self-inflicted).

Complications occurring after the onset of posterior urethritis where treatment was withheld, or where the patient stayed away were :—

Epididymitis : 4 cases.

Retention : 1 case (after a day of heavy cycling with a tight bandage round his penis).

Cystitis : 3 cases.

Rheumatism : 1 case (who attended on four occasions only).

In all these cases local treatment was withheld on the onset of the posterior urethritis, and alkaline sedatives were given.

On the other hand, the complications occurring while treatment was being given daily, consisted of two cases of epididymitis. The first case—already referred to—was one in which an instillation was faultily given. The second developed his epididymitis the day after he was married.

Results (Table I.)

The results have been set out in Table I. These have been divided into three groups. The first contains cases treated between July and September, 1930; the second cases treated between October and December, 1930; and the third cases in January and February, 1931.

In the second group treatment was carried out by a temporary and changing staff. The cases in Group 3 received weekly doses of detoxicated vaccines.

The average number of treatments given to the cases cured in fifty days was :—

28 in Group 1 ; 38 in Group 2 ; 37 in Group 3.

The average duration of treatment of the cases remaining anterior and not cured in fifty days was fourteen weeks.

The shortest case had sixteen treatments, and was absent seven times.

The effect of the untrained staff is clearly seen in Group 2. The best results—those in Group 3—may have

TABLE I

				Group. I.	Group. II.	Group. III.	Totals.	
Cases Completing Treatment.	Anterior on Admission.	Remaining Anterior.	Cured in under 50 days . .	13	7	13	33	62
			Cured in over 50 days . .	17	9	3	29	
		Becoming Posterior.	With reason .	20	13	7	40	55
			No reason .	4	8	3	15	
			TOTAL (1) .	54	37	26	117	117
	Posterior.		Posterior on 2nd day .	8	4	2	14	26
			Posterior on admission.	4	5	3	12	
			TOTAL (2) . .	12	9	5	26	
	TOTAL A (1 & 2) . .			66	46	31	143	143
Cases not Completing Treatment.			Defaulted . .	3	3	1	7	10
			Transferred . .	1	2	—	3	
			TOTAL B . .	4	5	1	10	
GRAND TOTAL (A & B) . .				70	51	32	153	153

been due to the weekly doses of detoxicated vaccines, or perhaps to the experience we had gained with the earlier cases.

I have not made any mention of relapse in this table. A certain number of cases did show a recurrence of urethral discharge on ceasing treatment. The early reappearance of discharge, should there be any, was a feature of the treatment. No cases relapsed later than three weeks after local treatment had been stopped. Some of these relapses are included in the cases cured in under fifty days.

The reasons for posterior involvement were, in their order of frequency: absence, faulty treatment, alcohol, lifting heavy weights, strenuous exercise, and sexual excitement.

The last-mentioned cause was admitted by two cases only. It may not be unreasonable to assume that some of those who developed posterior urethritis without any reason being found, did so for this reason.

The few cases found to be posteriorly infected on the second day I have considered as being so on admission.

The percentage of defaulters, about 5 per cent., is very low.

Comparison with Results of Cases in a Previous Year Treated with Total Irrigations. (Table II.)

It is interesting to compare these Pelouze-method results with cases seen at the Salford clinic during the same period of the preceding year, but treated with total irrigations. They are all cases who have completed tests of cure.

This Table (II.) shows that the average length of treatment undergone by the most favourable group of cases was eleven weeks. The corresponding period for cases treated by Pelouze's method is five weeks.

An interesting feature of the table is that the average duration of treatment of cases with anterior urethritis on admission is longer than that of cases with posterior urethritis on admission. The incidence of posterior complications is naturally greater in this latter group. An attack of epididymitis is said to augment the formation of antibodies, and this may be the explanation why this group has a relatively short average duration period of treatment.

The cases in which there were posterior complications are not those which relapsed. The greatest number of

relapses is found among those cases who never developed posterior complications.

It is evident that the principal cause of long duration of the disease, and the cause of most relapses, is to be found in the retention of gonococci in the follicles of the anterior urethra. This is confirmed by urethroscopic

TABLE II

Condition.			Number of Cases.	Complications. Arthritis.	Retention.	Cystitis.	Epididymitis.	Total Complications.	Number of Relapses.	Average Duration of Treatment in Weeks.	Remarks.
Anterior.	Remaining Anterior.	No Relapse.	29 } 43	—	—	—	—	—	—	11	
		Relapse.	14 }	—	—	—	—	—	14	28	
	Becoming Posterior.	With no Reason. No Relapse.	16 } 21 } 67	1	—	—	6	7	—	24 } 20	Reason of posterior onset only noted at time in a few cases.
		With no Reason. Relapse.	5 }	—	—	—	—	—	5		
		With Reason. No Relapse.	3 } 24	—	—	—	1	1	—	48	
		With Reason. Relapse.	– } 3	—	—	—	—	—	—		
Posterior.	No Relapse.		20 } 24	2	1	—	13	16	—	17	Including 3 epididymitis and 2 arthritis on admission.
	Relapse.		4 }	—	—	—	1	1	4		
Doubtful.	No Relapse.		37 } 56	1	—	2	4	7	—	23	1 case spur on *Os calcis*.
	Relapse.		19 }	1	—	—	2	3	19		
TOTALS.			147	4	1	2	27	34	42		

examination of these cases. In the Pelouze cases where the treatment has been concentrated on the anterior urethra, the average duration of treatment is less than half that of cases treated by total irrigations.

I am indebted to Col. E. T. Burke for permission to publish the results of the cases treated at the Salford Municipal Clinic.

Conclusions

The conclusions we can draw from the results of cases treated by this method are :—

(1) That this method of treatment is suitable for use in clinic practice provided that :—

(*a*) Well-trained attendants are available for the carrying out of the local treatment, and the urine charting.

(*b*) These charts are seen daily by the medical officer.

(2) That this method has considerable advantages :—

(*a*) Simplicity of application.

(*b*) Freedom from pain and discomfort.

(*c*) Cheapness of materials.

(*d*) Few complications.

(*e*) That treatment need only be given once a day.

(3) The results in the Salford Clinic obtained by this method of treatment are superior to those obtained by other methods. Only a few cases (13 per cent.) developed posterior urethritis without good reason. More than half of the cases remaining anterior were cured within fifty days (average of thirty-seven days). In the latest group 81 per cent. of the cases remaining anterior were cured in under fifty days.

There is evidence that cases of posterior urethritis on this treatment are cured more quickly, the most favourable cases taking no longer than uncomplicated cases of anterior urethritis.

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